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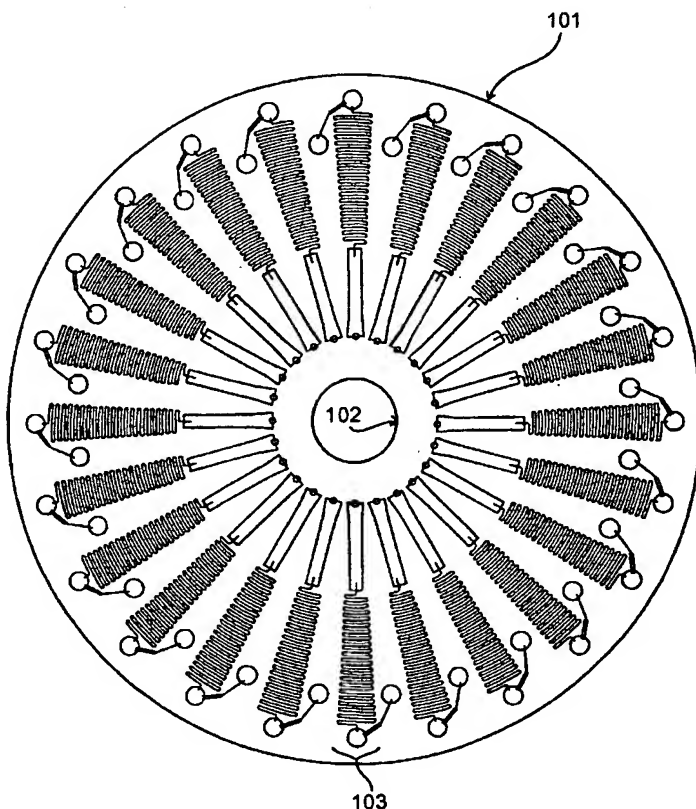
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- (21) International Application Number: PCT/US01/15824 (72) Inventors; and
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(54) Title: **BIDIRECTIONAL FLOW CENTRIFUGAL MICROFLUIDIC DEVICES**



(57) Abstract: This invention relates to methods and apparatus for performing microanalytic and microsynthetic analyses and procedures. The invention particularly provides microsystem platforms for achieving efficient mixing of one or a plurality of fluids on the surface of the platform when fluid flow is motivated by centripetal force produce by rotation.

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SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW.

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INTERNATIONAL SEARCH REPORT

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PCT/US 01/15824

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B01L3/00 B01F13/00 B01J19/00 G01N21/07

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B01L B01F B01J C12Q G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 744 975 A (MAILEN J) 10 July 1973 (1973-07-10)	1-3,6,8, 11,16, 17,20-23 8,15,18, 19
Y	column 2, line 30 -column 3, line 24 column 3, line 42 -column 3, line 54 column 4, line 12 -column 4, line 55 column 5, line 1 -column 5, line 35 figures 1-6 ----- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *&* document member of the same patent family

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PCT/US 01/15824

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	US 5 160 702 A (KOPF-SILL ANNE R ET AL) 3 November 1992 (1992-11-03) column 1, line 14 -column 1, line 33 column 3, line 38 -column 4, line 19 column 5, line 7 -column 6, line 63 column 7, line 5 -column 8, line 6 column 8, line 22 -column 8, line 51 column 9, line 1 -column 9, line 26 figures 1-20 -----	24 18,31 26,32
X Y	GB 2 341 924 A (AMERSHAM PHARM BIOTECH AB) 29 March 2000 (2000-03-29) page 1, line 12 -page 1, line 19 page 10, line 8 -page 13, line 8 figures 1-8 ----	25 8,15,31
Y	US 5 300 779 A (ALLEN JIMMY D ET AL) 5 April 1994 (1994-04-05) column 5, line 42 -column 5, line 58 column 7, line 21 -column 7, line 29 column 21, line 4 -column 21, line 31 column 21, line 44 -column 22, line 32 figures 1-5 ----	19
A	US 5 976 896 A (LEUNG DANTON KAI-YU ET AL) 2 November 1999 (1999-11-02) column 6, line 50 -column 6, line 56 figures 1-4 -----	26,32

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/15824

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3744975	A	10-07-1973	AT 322880 B	10-06-1975
			AU 4911972 A	23-05-1974
			BE 792465 A1	30-03-1973
			CA 966333 A1	22-04-1975
			CH 549209 A	15-05-1974
			DE 2260292 A1	14-06-1973
			DK 148520 B	22-07-1985
			ES 409317 A1	16-12-1975
			FR 2164306 A5	27-07-1973
			GB 1371465 A	23-10-1974
			IL 40915 A	13-03-1975
			IT 984613 B	20-11-1974
			JP 1046891 C	28-05-1981
			JP 48066481 A	12-09-1973
			JP 55036937 B	25-09-1980
			NL 7216233 A ,B,	13-06-1973
			NO 138303 B	02-05-1978
			SE 384086 B	12-04-1976
US 5160702	A	03-11-1992	NONE	
GB 2341924	A	29-03-2000	AU 3624399 A	29-11-1999
			EP 1077771 A1	28-02-2001
			GB 2350678 A	06-12-2000
			WO 9958245 A1	18-11-1999
US 5300779	A	05-04-1994	US 4948961 A	14-08-1990
			US 5004923 A	02-04-1991
			US 5164598 A	17-11-1992
			US 4756884 A	12-07-1988
			US 5144139 A	01-09-1992
			US 5204525 A	20-04-1993
			US 5140161 A	18-08-1992
			AT 105084 T	15-05-1994
			AU 593001 B2	01-02-1990
			AU 6088486 A	12-02-1987
			CA 1275231 A1	16-10-1990
			DE 3650530 D1	18-07-1996
			DE 3650530 T2	21-11-1996
			DE 3650574 D1	31-10-1996
			DE 3650574 T2	13-03-1997
			DE 3650610 D1	15-05-1997
			DE 3650610 T2	25-09-1997
			DE 3689812 D1	01-06-1994
			DE 3689812 T2	01-09-1994
			EP 0212314 A2	04-03-1987
			EP 0483117 A2	29-04-1992
			EP 0485368 A2	13-05-1992
			EP 0488994 A2	03-06-1992
			JP 7092169 A	07-04-1995
			JP 7104356 B	13-11-1995
			JP 1945801 C	23-06-1995
			JP 6058373 B	03-08-1994
			JP 62129759 A	12-06-1987
			JP 2032116 C	19-03-1996
			JP 6094722 A	08-04-1994
			JP 7069330 B	26-07-1995
			JP 2595422 B2	02-04-1997

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/15824

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5300779	A	JP 6094723 A	08-04-1994
		JP 2075360 C	25-07-1996
		JP 6094724 A	08-04-1994
		JP 7117546 B	18-12-1995
		US 4963498 A	16-10-1990
US 5976896	A	02-11-1999	
		US 5624850 A	29-04-1997
		AU 732627 B2	26-04-2001
		AU 3807097 A	20-02-1998
		BR 9710887 A	17-08-1999
		EP 0934524 A2	11-08-1999
		WO 9804920 A2	05-02-1998